NRO REVIEW COMPLETED

COR 1483

0 6 DEC 1961

MEMORANDUM FOR: Chief, Special Projects Branch, DPD

SUBJECT   : An Example of Weather Forecast Reliability.

1. We were asked to obtain forecasts and verifying weather reports for five selected USSR targets over an extended period of time. The targets were Plesetsk, Yurya, Yoshkara Ola, Nishnaya Tura and Itatsk. The purpose of this exercise was to evaluate the weather support factor of a CORONA mission concept in which the launch would be delayed for good weather on day one. Therefore, the forecasts were filed at L-18 hours (0700Z), which would be the launch decision cut off time.

2. The forecasts, verifying weather reports and the verification reliability scores are tabulated in figures one through five. While this sample is much too small to be a representative evaluation of WECEN capability, the verification scores agree well with those computed on their past performance. Several significant items have been gleaned from these figures:

 a. Of the eleven forecasts which called for favorable conditions over a target, nine (82%) were correct. Four of the five targets had favorable weather every time it was forecast to be favorable.
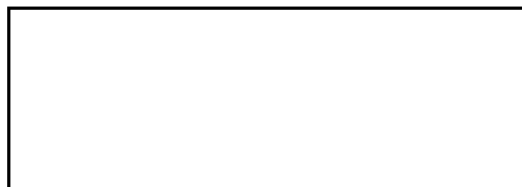
 b. Since favorable weather occurred in only 22 of the 50 cases considered, the average random probability of encountering favorable conditions during the ten day period was only 44 %. In operational terms, these figures mean that the chances of obtaining successful target coverage were twice as great on the days when favorable conditions were forecast.

 c. One target had favorable weather on only one day out of the three days that it was forecast to occur. However, since favorable conditions occurred at that location on only 3 days of the 10 day period, the random probability of success there was 33%. Therefore, even with all the forecast errors concentrated on one target, the forecast reliability for that target was no lower than the random probability of encountering favorable weather there.

d. Favorable weather did occur 11 times when it had not been forecast. This type of missed forecast would hurt some operations, but not the type considered here. In this exercise, the object was to be certain that the mission did not operate unless conditions were favorable, and the forecasts were geared to this operational concept.

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Chief, Weather Staff, DPD

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Figure 1

PLESETSK

Date: November	9	10	11	12	13	14	15	16	17	18	Total	%
Forecast												
Category	4	4	3	2	4	4	4	4	4	4		
Favorable			X	X							2	20
Unfavorable	X	X			X	X	X	X	X	X	8	80
Actual Weather												
Category	3	3	2	2	3	4	4	4	4	5		
Favorable	X	X	X	X	X						5	50
Unfavorable						X	X	X	X	X	5	50
Favorable Weather Forecast Hits			X	X							2	100

100% of the favorable weather forecasts were correct

Figure 2

YURYA

Date: November	9	10	11	12	13	14	15	16	17	18	Total	%
Forecast												
Category	4	4	4	4	3	3	4	4	4	4		
Favorable					X	X					2	20
Unfavorable	X	X	X	X			X	X	X	X	8	80
Actual Weather												
Category	4	4	4	2	2	2	2	5	5	5		
Favorable				X	X	X	X				4	40
Unfavorable	X	X	X					X	X	X	6	60
Favorable Weather Forecast Hits					X	X					2	100

100% of the favorable weather forecasts were correct

Figure 3

YOSHKARA OLA

Date: November	9	10	11	12	13	14	15	16	17	18	Total	%
Forecast												
Category	4	4	4	4	4	2	4	4	4	4		
Favorable						X					1	10
Unfavorable	X	X	X	X	X		X	X	X	X	9	90
Actual Weather												
Category	4	4	5	3	2	3	4	5	5	5		
Favorable				X	X	X					3	30
Unfavorable	X	X	X				X	X	X	X	7	70
Favorable Weather Forecasts Hits						X					1	100

100 % of the favorable weather forecasts were correct.

Figure 4

NIZHNAYA TURA

Date: November	9	10	11	12	13	14	15	16	17	18	Total	%
Forecast												
Category	5	4	4	4	3	4	3	2	3	4		
Favorable					X		X	X	X		4	40
Unfavorable	X	X	X	X		X				X	6	60
Actual Weather												
Category	4	4	4	3	4	3	3	4	4	4		
Favorable				X		X	X				3	30
Unfavorable	X	X	X		X			X	X	X	7	70
Favorable Weather Forecasts Hits							X				1	33

33% of the favorable weather forecasts were correct.

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Figure 5

ITATSK												
Date: November	9	10	11	12	13	14	15	16	17	18	Total	%
Forecast												
Category	4	5	4	4	4	4	3	3	4	3		
Favorable							X	X		X	3	30
Unfavorable	X	X	X	X	X	X			X		7	70
Actual Weather												
Category	4	4	4	3	2	2	3	3	3	2		
Favorable				X	X	X	X	X	X	X	7	70
Unfavorable	X	X	X								3	30
Favorable Weather Forecasts Hits							X	X		X	3	100

100 % of the favorable weather forecasts were correct